

PROPOSALS

FOR

RECOVERING PERSONS

APPARENTLY DEAD

BY

DROWNING,

AND

SUFFOCATION

FROM

OTHER CAUSES.

PUBLISHED BY ORDER OF
THE GOVERNORS OF THE DISPENSARY.

NEWCASTLE:

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At a Meeting of the MEDICAL SOCIETY, held the 10th of November, the following pages were read and approved of; and a printed copy ordered to be sent to each Member, with a request that he would offer in writing to the SOCIETY, on Tuesday the 1st of December, every objection, alteration, or improvement, which may occur on a careful perusal.

PROPOSALS
FOR THE
RECOVERY OF PERSONS
APPARENTLY DEAD
BY
DROWNING, &c.

THE Reports of several establishments on the Continent, as well as of the Humane Society in London, have fully proved, that persons apparently dead from drowning, or suffocation from other causes, may, by proper means, be restored to life. But whilst the success which has attended these establishments, must give pleasure to every person interested in the cause of humanity; yet it is to be regretted, that the means of restoration have not been more publicly understood, and more generally adopted.

The frequent instances of death, by drowning, which have happened upon the river Tyne, and the unsuccessful attempts of recovery, have afforded the strongest proofs, that the methods of restoration have not been known to the public, or have not been speedily or properly applied.

In order to give relief to persons in such unfortunate circumstances, in this town and neighbourhood, the Governors of the **NEWCASTLE DISPENSARY** have established a department of their Charity, on the following plan, for the recovery of the vital motions, when suspended by drowning; and, to render this department more useful, they have also extended it to the methods of restoration in other cases of apparent death.

P L A N.

1st. The Governors of the Dispensary have undertaken to publish, in an extensive manner, such *Remarks* on different kinds of apparent death, and such *Methods* of treatment as shall be approved of by the **MEDICAL SOCIETY** of Newcastle.

2d. They will engage proper accommodations at some public or other houses, near the river, at Newcastle, North and South-Shields, at Howdon Dock, and Lemington, for the reception of drowned persons.

3d. The instruments and medicines necessary for the purpose of restoration, inclosed in a proper box, shall be kept at the receiving-houses, that the Medical Assistants may procure them without delay.

4th. Medical Gentlemen, residing near the places where accidents from drowning usually happen, shall be engaged to give their assistance.

5th. A premium of one shilling shall be given to the messenger who shall bring the first SURGEON to the assistance of the drowned person.

6th. The Medical Assistants shall be empowered to distribute a reward, not exceeding five shillings, to the persons they shall employ to assist in the methods of recovery, provided they persevere in the means recommended, for four hours or upwards.

7th. If the unfortunate person be in ability, and recover, it is expected, that he shall defray the expence of his accommodations; or if he cannot be restored, the same is expected from his relations.



18. The Government of the Dispensary have undertaken to publish, in an extensive manner, such accounts on different kinds of apparent death, and such methods of treatment as shall be approved by the Medical Society of Newcastle.

REMARKS

DIFFERENT KINDS

OF

APPARENT DEATH.

INTRODUCTION.

1. **T**HE MEDICAL SOCIETY of Newcastle, in compliance with the request of the GOVERNORS of the Dispensary, have investigated the nature of *apparent death*, arising from the causes which become the object of the preceding plan, with care and attention: And, in the following Remarks, they have chiefly studied conciseness, plainness, and precision; that the public, at large, may understand a subject, in which they are so peculiarly interested.

2. Apparent death consists in a total, tho' temporary cessation of all the powers of motion and sense; to be more particular, the lungs cease to act; the heart and arteries to beat; and the brain and nerves to diffuse their energy. It, therefore, only differs from real death, in this, that the living principle is not extinct, but only lies dormant; which, sometimes spontaneously, but more frequently and certainly, when excited by proper means, again becomes active: In consequence of which, all the functions of life are restored.

3. The common opinion, that life deserts the body as soon as the breath ceases, is not confined to the vulgar alone; but, notwithstanding the instances of recovery from apparent death, is still believed by many of the more discerning part of the community. As this opinion has been productive of the most dangerous consequences, the SOCIETY wish to impress the public with the following truth; that the living principle, in every case of death, keeps possession of the body for some time, at least, after all the actions of life have disappeared; nay, probably, it never entirely leaves the body, so long as any degree of animal heat remains in the internal parts.

4. By proper attention to these circumstances (2. g.), the SOCIETY flatter themselves, that persons suddenly and apparently dead,

dead, especially from the causes, to be afterwards enumerated, will, for the future, not be considered to be *really* dead, till such time as the methods of restoration have had a fair trial.

5. But whilst the SOCIETY endeavour to animate the public, to use every exertion to recover those apparently dead, they do not wish to conceal the great uncertainty of a successful termination. In drowning, especially, the methods of treatment prove unsuccessful, from the person lying too long under water; from his being suddenly seized with other diseases, or being in a state of intoxication, at the time of the accident; and from various other causes. But, in such dangerous situations, if *one* in *fifty* can be restored, it will amply compensate for many fruitless attempts. If, however, any person conceive this to be a small proportion, let him but for a moment consider, if this *one* should happen to be his own son, or a beloved friend, with what raptures he would extol the means which had averted the most poignant distress!

On the Nature of APPARENT DEATH from DROWNING, and on the most effectual Methods of Recovery.

6. From various experiments, instituted by different members of the SOCIETY, the following appearances have been observed to take place in drowning, to which the attention of the reader is requested, as not only pointing out the nature of the death, but the methods, which ought to be employed to effect a recovery.

7. When an animal is kept under water, in a few seconds it begins to emit its breath forcibly, so as to occasion air bubbles. This emission of air from its lungs is followed with as strong a desire to draw in air, and in these efforts, it commonly inspires water (a). Its struggles, in a few minutes, become imperceptible, and it falls down motionless. Upon taking it out of the water, provided only eight or ten minutes have elapsed after all its struggles are over, the nose and mouth appear remarkably pale, the eyes do not protrude, and the pupils, tho' they nearly retain their natural lustre, are quite dilated; all sense and motion, both external and internal, except a slight contraction of the right side of the heart, are now lost; and if no means of recovery be

(a) As it was thought of consequence to ascertain this point; a cat, six weeks old, was frequently immersed in a strong solution of copperas, and as frequently allowed to come above the surface, to inspire, in order to imitate what frequently happens in drowning. It was at last brought up, before it was dead, and instantly strangled. Upon dissection, the frothy fluid in the lungs, and the lungs themselves, became as black as ink, upon adding a tea-spoon full of infusion of galls to the former, and moistening the lungs with a little of the same infusion. The experiment, with the same result, was repeated on a young whelp.

be made use of, the body gradually becomes cold, and with the loss of heat, the heart loses the power of contraction.

8. Upon dissection, no falseness in the vessels within the skull, nor any disease in the brain, or its membranes, are to be found. The lungs also appear sound; are generally about half distended, but sometimes more, when the animal is frequently allowed to come to the surface of the water, so that he may inspire. A quantity of frothy fluid (*b*), consisting of mucus, with a little of the water in which the animal was drowned, in every experiment except one, was squeezed from the lungs.

9. The right-side of the heart is full of black blood, and the large veins going out from this side of the heart, thro' their whole course, to the middle of the thighs, the arm-pits, and almost to the jaws, are full of blood of the same colour. The left-side of the heart is almost empty, which is also the case with the whole of the large arteries, except the trunks of the artery, which enters the lungs, which is commonly filled with blood. The external blood-vessels are empty, and the muscles commonly look as white as if the animal had been bled to death.

10. Upon the whole, it appears (8. 9.), that no injury is done to the organization of the vital parts; but that the heart and large veins, in its neighbourhood, are distended with blood, whilst every other part seems, in a great measure, to be drained of that fluid. Nor are these circumstances invalidated by the appearances, which have been observed in some bodies of drowned persons, who are never opened till many hours after death; for altho', in a few, the vessels of the brain have been found full of blood, yet, generally, this organ, as also the lungs, have been found in a sound state. Neither does the prominent, or blood-shot eye, the swelled bloated face, or the lividity of the skin, which are so often observed in drowned persons, who have been long under water, prove any thing more, than that the blood, after death, had drained to depending parts.

11. From what has been advanced, in the three preceding paragraphs, it appears, that the first cause of the suspension of the vital motions in drowning, is the stoppage of respiration; in consequence of which the circulation cannot be carried on, and the blood, therefore, is accumulated in the right-side of the heart, and in all the large internal veins. With this stoppage of the cir-

(*b*) By drowning a large old cat, and a kitten of four weeks old, in a solution of copperas, one ounce of frothy fluid was found in the air vessels of the lungs of the former; and one dram and a half of the same fluid in the latter: By adding a strong infusion of galls, the fluid in both became black, and as near as could be ascertained, the quantity of solution of copperas, in the lungs of the former amounted to two drams; and in the latter to two scruples. But, in one experiment, made by another member of the Society, the water in the lungs of a drowned whelp of five weeks old, was much more considerable; and water was also found in its stomach.

circulation, the brain loses its energy, the body becomes cold, and with the total loss of heat, it may be reasonably supposed that the principle of life is extinguished (c).

12. From this view of the subject, the most likely means to restore persons apparently dead by drowning, will consist: 1st, in renewing the action of the lungs, without which the accumulation of blood about the heart cannot be removed; nor the heart itself be brought into proper motion: And 2d, in supporting a due degree of animal heat, without which the vital principle cannot, with effect, exert its influence.

13. To restore the action of the lungs, it is indispensably necessary that they should be inflated. When the person has not been long under water, perhaps blowing air into the mouth or nose with a wooden pipe may be all that is necessary to put them into motion. But in many cases, it will require great skill to inflate them effectually. As the directions for doing this with instruments will be given in another place (d), it would be improper to enlarge on them here. It must, however, be observed, that the inflation ought not to be done with violence, but so as to imitate natural, easy respiration. And as, in many cases, the inflation ought to be continued for one or two hours, it will be necessary to employ a pair of bellows. But it must be observed, as soon as the pulse returns, the inflation should be gradually lessened, and, in a little time, totally laid aside.

14. By artificial breathing (13.), judiciously and assiduously employed, not only the frothy fluid, already taken notice of (8.), which renders the recovery from drowning more uncertain than other cases of suffocation, will be expelled; but the heart will most likely be put into motion, by which the accumulation of the blood there, and in its neighbourhood (9. 10.), will also be removed, and the circulation restored.

15. At the same time, that the measures recommended (13.) are assiduously employed, other assistants should be endeavouring to restore, and to keep up a due degree of animal heat. Perhaps the speediest method of doing this, (were hot water always in readiness) would be to put the patient into a warm bath. But as this cannot be speedily procured, but more especially, as it interferes with other essential applications, the body must be

(c) Altho' not immediately connected with the subject, the SOCIETY cannot help entering a caution against the hasty custom of laying out persons supposed to be dead. In great sinking of the strength, especially in the end of acute diseases, patients frequently lie in a state exactly resembling death. If the bed-cloaths be removed, the heat, on which the vital principle depends, will soon be dissipated, and every spark of life destroyed. By not attending to this circumstance, it is to be feared, that many have been actually killed, who, by a different treatment, would have recovered.

(d) See the appendix, Paragraph 38, 39, 40, 41.

gradually brought to a proper heat, by placing it on a warm bed, or mattress, and by the use of general frictions with warm cloaths (*e*). The frictions, however, should be at first moderate, and performed only with a view to restore heat, and not force the blood towards the heart, which in drowned persons is generally found too much distended (9.10.).

16. If the body has been taken out of the water in frosty weather, especially if it has been afterwards long exposed to the air, the heat, at first, should be applied in a very low degree; and if the thermometer be under the freezing point, and the body, when stripped, feel cold, and nearly in a condition with those that are frozen; it will, at first, be indispensably necessary to make use of frictions with snow, or cold applications; as heat, in such cases, has been found pernicious. In a little time, however, heat must be gradually employed.

17. Upon the whole, great care and nicety ought to be observed in the application of heat, which, in every case, ought to be proportioned to the powers of life. This is well elucidated by Mr Hunter in the following quotation:—"From observation and experiments, it appears to be a law of nature, in animal bodies, that the degree of external heat should bear a proportion to the quantity of life; as it is weakened, this proportion requires great accuracy in the adjustment, while greater powers of life allow it greater latitudes. I was led to make these observations, by attending to persons who are frost-bitten; the effect of cold in this case, being that of lessening the living principle. Heat must, at first, be gradually applied, and proportioned to the quantity of the living principle; but as that encreases, you may encrease the degree of heat. If this method is not observed, and too great a degree of heat is at first applied, the person or part loses entirely the living principle, and mortification ensues. This process invariably takes place with regard to men" (*f*).

18. Altho' the recovery of drowned persons depends almost entirely upon the methods recommended (13.15.16.); yet when the body is in a condition to be acted upon, cordial and invigorating medicines, such as throwing brandy and water into the stomach and intestines, pepper-mint water, æther, or spirit of hartshorn, diluted with water, may prove useful auxiliaries (*g*). But the same moderation in their use must be observed, as has been recommended in the application of heat.

19. The means for recovering the motion of the lungs, and animal heat, should often be continued for several hours; for it

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(*f*). For more particular directions, see the Appendix. I.

(*f*) Animal Economy, p. 121, 122.

(*g*) See the Appendix. II. Paragraph 42.

appears from the reports of the *Humane Society*, that, in a very great number of cases, one, two, and even four hours, were perseveringly employed before the first signs of life appeared (b).

20. Electricity being the most powerful of all stimulants, it has been recommended by several ingenious authors (i), and, according to the reports of the *Humane Society*, has been found serviceable in drowning; it ought, therefore, to be tried, when the heart cannot be brought to act by the means mentioned (14). Shocks, therefore, may be transmitted thro' the heart, the head, and the spinal marrow; but they ought neither to be employed so gently as to produce no effect, nor so violently as to do mischief.

21. The SOCIETY being of opinion, that bleeding can be seldom employed as the means of recovery, refrain from recommending it in the beginning; but when life returns, and the pulse will bear such an evacuation, it will frequently become indispensably requisite to remove determinations to the head, and to the lungs; which often take place from an irregular distribution of the blood to these organs.

22. As the remarks, which have been already offered, will apply, with a few exceptions, to other cases of suffocation, the SOCIETY shall briefly discuss the remaining part of the subject.

APPARENT DEATH from HANGING.

23. In hanging, the external vessels, bringing back the blood from the head, are immediately compressed, while the blood is still carried on in the internal arteries. The windpipe is soon after shut by the cord, the ingress of air prevented; in consequence of this, the face becomes red and livid, and the person or animal is speedily carried off by suffocation.

24. On dissection, the blood vessels of the brain, in several animals that were strangled, appeared turgid with blood, but no other disease was observed within the skull. The lungs were, in general, quite collapsed, free from frothy fluid, and in every respect sound. The heart and large adjoining vessels exhibited exactly the same appearances as in drowned animals (8.9.10.).

25. From this view (23.24.) it would appear, that, together with bleeding from the jugular veins, or cupping in the neck, the other methods of treatment ought to be the same as recommended for the recovery of drowned persons.

AP.

(b) In many cases of complete recovery recorded in the *HUMANE SOCIETY*, the persons were under water twenty, thirty, one forty, and one forty-five minutes, and in these cases, the restoration, as might be expected, was tedious.

(i) A. Fothergill, Henly, Hunter, Kite.

APPARENT DEATH from NOXIOUS VAPOURS.

26. Noxious vapours arise from various sources; from fermenting liquors, from the fumes of charcoal, of burning quick lime, and of metals during their calcination; from opening vaults, draw-wells, wells of ships, and ditches long shut up; from the damp in mines, &c.

27. In the coal-pits of this neighbourhood, there frequently arise two kinds of noxious air. The first, usually termed the *choke-damp*, is a natural fixed air, which being specifically heavier than atmospheric air, occupies the bottom of the mine. The other is called the *fire-damp*, which is a natural inflammable air, and being ten times lighter than common air, occupies the top of the mine.

28. From some experiments, which would be tedious to relate, it appears that these vapours (26.) occasion a suspension of the vital motions, and death, by entering the lungs; and, excluding the atmospheric air, and in other respects (if the *fire-damp* be excepted) when it takes flame (1), no farther injury is done to the body.

29. The bodies of animals, suffocated in these vapours, exhibit the following appearances:—The limbs remain flexible for a long time; the eyes retain their lustre; the temperature of the body, and even a heat higher than the healthy standard, in some instances, continue several hours after death. This is particularly the case with animals suffocated in the fumes of charcoal; and in them the blood remains fluid, and even highly florid. In animals suffocated in fixed, and in inflammable air, altho' the limbs continue flexible, the blood was not florid. The vessels of the brain were found turgid in animals suffocated in these vapours; the lungs were found; the heart and adjoining vessels were equally turgid as in those which were drowned or hanged.

30. The most effectual means of recovering the vital actions, when suspended by noxious vapours, consist in inflating the lungs as soon as the body is removed to the open air; in sprinkling the face, and, when the heat is above the standard of health, even the whole body, with cold water. In persons suffocated by the fumes of charcoal, advantages have arisen from rubbing the body with snow. But here the heat should be *only diminished in proportion to the powers of life*; and, therefore, if the body become cold, equal advantage will accrue from the gradual application of warmth. The state of the vessels of the brain (29.) would seem to require bleeding; and accordingly it has been recommended

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(1) The *fire-damp* frequently takes flame, by which means the pitmen are often miserably burnt. At the same time, others are found without signs of life; and as they are erroneously supposed to be burnt to death by the flame, and not suffocated by the vapour, methods of restoration unfortunately are seldom applied.

ed(/). Blood may therefore be taken from the jugular veins, or from the neck (25). In all other respects, the methods of treatment will be the same as in those who are drowned.

APPARENT DEATH from SMOTHERING, and the want of RESPIRATION in still-born CHILDREN.

31. Children, from inattention or other causes, are frequently smothered in beds. When not overlaid, the functions of life are solely suspended by breathing confined air. From experiments upon brutes, it appears that, in this case, the lungs are collapsed, and, except the accumulation of blood in the heart, and large vessels in the neighbourhood, no injury is done to the rest of the system. If the means of recovery, therefore, be not too long delayed after the lungs and heart have ceased to act, there will be great hopes of restoring the patient. If the body be too hot, as is commonly the case, it should be exposed, at first, to a current of air. The lungs should be immediately inflated; and, afterwards, in every other respect, it should be treated conformably to what has been recommended in suffocation from drowning.

32. In such still-born children as come into the world, in other respects, with a healthy appearance, great hopes may be entertained from inflating the lungs, if too much time have not been lost. But this process ought to be continued assiduously for some hours, by blowing air thro' a quill, or any small tube inserted into the mouth. The temperature of the body should at the same time be kept up by a due degree of warmth; and the blood propelled from the surface to the heart by proper frictions.

A P P E N D I X I.

CONTAINING

RULES to be observed by the SPECTATORS in endeavouring to recover persons apparently dead by drowning.

I.

33. As soon as the body is taken out of the water, a person must inflate the lungs of the patient, by blowing into the mouth, or, (which is better) into one nostril, thro' a wooden pipe (m), a roll of cap-paper, or any thing else that will effectually convey the breath up the nostril; whilst the other nostril, together with the mouth, is closely shut, that no air may pass otherwise than by the pipe. At the time of blowing thro' the pipe, another person, in order to prevent the air getting into the stomach, must gently

(1) PORTALS.

(m) Wooden pipes are always in readiness at the receiving-houses.

gently press the projecting part of the windpipe backwards. When the lungs are filled, the person must remove his hand from the mouth, and press the belly and breast, so as to let the air pass out. When by these means the lungs have emptied themselves, the blowing thro' the pipe is to be repeated in the same manner, so that natural breathing, as far as possible, may be imitated. If the lungs cannot be, by these means, distended, it most probably will proceed from some stoppage about the opening into the windpipe, which will in all likelihood be removed by pulling the tongue forwards.

II.

33. At the same time that air is blowing into the lungs, other by-standers should be employed in stripping off all the wet cloaths, and in rubbing the body dry with flannel, or such cloths as can be procured. The body should then be wrapt in a warm blanket, or in the spare garments of any of the spectators.

III.

34. If, upon a short trial, these methods do not succeed in restoring the breathing, the body ought to be immediately carried to the nearest *Receiving-house*, or, if it be at any distance, to the nearest building. In removing the body, great care should be taken to keep it in an easy posture, with the head and shoulders a little raised. It will be best conveyed in the arms of two persons, while a third takes care that the neck be not too much bent forwards, or to one side. If the body be taken out at a considerable distance from any house, it should be laid in a cart upon straw, on one side, with the head and upper parts raised; and, in this position, a brisk motion will do no harm.

IV.

35. The body being now conveyed to a house, it should be placed upon a warm bed or mattress, and covered with a warm blanket. The head and chest should be considerably raised, but not so much as to slide down, in which position the body should be kept during the whole of the future attempts of recovery. It will now be again indispensably necessary to renew the endeavours to restore life, by *blowing air into the lungs*, as directed in Rule I; and by *restoring a moderate degree of heat*, by gently rubbing the body with warm flannels, or other warm cloths; and by applying bottles full of warm water, wrapped up in flannel, to the feet.

V.

36. The means of cure recommended in Rule I. and II. and more particularly mentioned in the end of Rule IV. must be continued for a long time: Perseverance is absolutely necessary; and it is often only after *two, three, or four* hours of uninterrupted labour, that the first signs of life appear.

37. Altho'

VI.

37. Altho' the above methods of cure ought to be immediately begun by any of the by-standers of discernment, and have been often attended with the happiest effect; yet, as the application of the means requires skill and dexterity, and as it is frequently absolutely necessary to employ *instruments* to inflate the lungs; *one or two* of the MEDICAL ASSISTANTS should be called in without delay. The loss of every moment, or the misapplication of the means, is attended with the utmost danger to the unfortunate object, who is approaching nearer and nearer to a state from which he cannot recover.

A P P E N D I X II.

C O N T A I N I N G

A Description of a Pocket CASE of INSTRUMENTS for the Recovery of Persons apparently dead, with the Methods of USING them.

38. Many ingenious instruments have been recommended by authors, and adopted by different establishments in their endeavours to recover the apparently dead; but the MEDICAL SOCIETY have preferred the improvements lately made upon them by Mr SAVIGNY of London, both on account of the utility of the instruments, and their being contained in a case, which is extremely portable. Some management, however, is required to adjust the *instruments* to the different purposes; but a careful inspection of their component parts (*n*), and attention to the following directions, will render their application easy.

39. When air from the lungs of a healthy person is to be used, the *ivory mouth-piece* is to be screwed on one end of the *flexible tube of red leather*, and the *ivory nozzle* upon its other extremity, by which means, a blow-pipe is compleatly formed; which is to be inserted into the nostril; and to be managed in the same manner as the *wooden pipe* (33.). But as atmospheric air (*o*) should be, in most cases, preferred for inflating the lungs properly, the following adjustment of the instrument will be required: The conical part of the *hollow screw*, by means of the *brass winch*, is to be firmly screwed into the muzzle of any common pair of *bellows* (*p*): The *ivory mouth-piece* of the *flexible*

(*n*) Mr Savigny's original case contained an *apparatus* for injecting the fumes of tobacco, which the SOCIETY have not recommended.

(*o*) Dephlogisticated air, discovered by Dr Priestly, preserved in bladders, has been recommended by several authors; but as the expansion of the lungs seems to be the principal object of the inflation, the Society think it of little importance whether dephlogisticated, or atmospheric air be used; and indeed, those who have recommended the former were never able to recover any animal with it, when atmospheric air had been found ineffectual.

(*p*) Proper bellows are always in readiness at the place where the instruments are lodged.

ble tube, is then to be removed, and the other end of the *conical screw* to be fitted in its place. The instrument being thus completed, "a proper person, stationed at the head of the body, is to pass the tube into the nostril, and sustaining it there with the fore-finger, he is to compress the other nostril with his thumb, and the mouth with the remainder of the same hand, that no air may pass out. With the other hand, he is to make a suitable pressure upon the prominent part of the windpipe, to prevent air passing into the stomach. The medical director is then to work the bellows, which ought, at one play, to throw in a sufficient quantity of air to fill the lungs. When they are properly distended, the hand should be removed from the mouth, and the lungs are to be assisted in emptying themselves by compressing the belly and chest. The same process is to be repeated for some time, that, as far as possible, the manner of natural respiration may be imitated." If the air do not pass into the lungs so as to distend them compleatly, it probably arises from the aperture of the windpipe being shut, which may generally be remedied by bringing the tongue forwards.

40. But if farther impediments occur to the inflation of the lungs, the *ivory nozzle* (39) must be removed, and the *silver instrument* in the form of a catheter screwed on the *tube of red leather*, in its place. The instrument being thus completed, "the medical director should place himself on the right side of the patient; and introducing the fore-finger of his left hand, at the corner of the patient's mouth, he should push the point of it behind the *epiglottis*, and using this finger as a directory, he must enter the tube, with the other hand, at the left corner of the mouth, till the end of the instrument has past beyond the point of his fore-finger; and the instrument is then to be suffered to fall rather than to be pushed into the *glottis*." The bellows are then to be worked as in the former process (39).

41. If the methods proposed (39.40.), fail of inflating the lungs, an opening into the wind-pipe may be made; and certainly ought to be tried as a last resource. The silver instrument should be introduced into the opening, fitted with the bellows, and to be worked in the same manner as recommended (40.); by which means air will be certainly thrown into the lungs.

42. The next instrument recommended is the *elastic tube of black leather*, for conveying medicines into the stomach. The small end must be carefully introduced down the gullet, into the stomach; and any liquid cordial, such as *spirits*, *ether*, *volatile liquor of hartshorn*, or *oil of peppermint*, properly diluted with water, must be poured in small quantities into the other end of the tube; and if the liquor do not descend readily, blowing upon it will make it pass into the stomach.

43. The next instrument is a large *bladder*, which may instantly

It is connected with a proper pipe, contained in a division of the case. A chyler prepared with *brandy, gum* or the *oil of pepper-mint*, largely diluted with warm water, must be injected. 44. Altho' from the sympathy which subsists betwixt the stomach and whole system, and the irritability remaining long in the intestines, much benefit may arise from the processes (42.43.) as auxiliaries; yet no means, unless for a very short space, must interfere with the more important articles of *inflating the lungs*, and *restoring animal heat*.

45. The last instrument (9) is a *thermometer* upon Mr HUNTER's principles, which is extremely well calculated for ascertaining the natural heat remaining in the body; and for regulating the application of artificial heat. The freezing point is marked on the stem by a scratch on the glass, and the divisions upon an ivory scale embracing the glass; are easily seen thro' the stem. By applying this instrument to the body, and finding the temperature considerably below 98° , artificial heat should be gradually applied till it be uniformly heated to 98° , or 100° . But if the external parts of the body be so chilled, that the thermometer sinks below 32° , cold applications will be at first necessary; and in this case the heat should be afterwards increased slowly and gradually.—The instrument may likewise be easily introduced into any cavity, so as to ascertain the degree of internal heat; which remains, in general, for some hours after the external surface is cold. Therefore, if it be pushed three or four inches up the *rectum*, the presence or absence of life may be ascertained by the rise or fall of Mercury in the tube.

CONCLUSION.

46. In composing the preceding pages, many authors have been consulted; but the SOCIETY cannot conclude without expressing their great obligations to the following: Dr CULLEN, Dr MONRO, Dr HAWES, Mr HUNTER, Mons. PORTAL, Dr GOODWIN, and Mr KITE; the two last of whom received the *Prize Medals* of the HUMANE SOCIETY, for the best original essays on suspended animation.

(9) Proper phials for ether, volatile liquor of hartshorn, and oil of pepper-mint are also contained in the case; and likewise phosphoric matches, and a wax candle, when a light cannot be otherwise readily procured.

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